Draft Ranking System for No Discharge Area Designation
Pursuant to PL Chapter 655
August 26, 2003

## Appendix A
## Ranking Formula and Criteria

In order to create a fairly objective prioritization of all the harbors in Maine, the pumpout advisory group selected critical criteria then developed a formula to use those criteria. The criteria were narrowed from an initial list of over 20 to 8 for simplicity. The group then decided to use a fairly gross scale, again for simplicity, with the highest score receiving the highest priority. The logic behind criteria and the scale for each are detailed below.

Ranking Criteria:

### A. Existing Point Sources

Other point sources of pollution need to be considered in the prioritization because they can impact the overall water quality and impacts on sensitive resources. Removal of any pollution from boats may incrementally improve the water quality but it may not result in significant changes if point sources are also present. Therefore, if a harbor did not have other point sources of pollution, it may be more sensitive to improvements resulting from increased pumpout use. The point sources evaluated included municipal treatment plant discharges, combined sewer overflows, industrial discharges and overboard discharges. The DEP used the GIS system to determine how many different types of point sources were located in the harbor, and that number was then translated into a value as follows.

No point sources = 3 points
1 type of point source = 2 points
2 types of point sources = 1 point
All types of point sources = 0 points

### B. Water Quality

The current water quality of a harbor was also deemed an important criterion. However, in this case, because the majority of coastal waters are only impaired by high bacteria levels, the group determined that waterbodies not attaining water quality standards should receive a higher score. This conclusion was based on the premise that boats, although certainly not the only source of bacteria to harbors, could significantly impact the harbor water quality. The DEP used water quality data from our own sampling efforts as well as extensive data provided by the Department of Marine Resources (DMR) to determine whether the harbor was meeting water quality standards. The data from DMR has been statistically evaluated as accurate 90% of the time. Water quality scores for bacteria that are below 15 colonies per 100 milliliters meet water quality standards for shellfish harvesting, a designated use of all marine or estuarine waters of the state. Scores of 15 to 30 col/100ml were determined to be in marginal compliance, waters scoring over 30 col/100ml were determined to not be attaining standards. Water bodies that did not have data were assumed to be attaining standards.

Attaining standards (0-15col/100ml) = 1 point
Marginal attainment (>15-30 col/100ml) = 2 points
Non-attainment (>30 col/100ml) = 3 points

**C. Sensitive Resources**

The group felt it essential to account for the impacts of potential pollution from boats by evaluating the presence of sensitive natural resources in the harbor. The resources evaluated were: shellfish harvesting areas, aquaculture leases, endangered species habitat, and state identified natural areas. The criterion was set up so the higher the number of natural resources in the harbor, the higher the score. The DEP used GIS data from DMR and other projects done by the DEP to evaluate the number of resources in each harbor.

No resources = 0 points
Few resources (2 or less) = 1 point
Some resources (3-4) = 2 points
Many resources (>4) = 3 points

**D. Boat Services**

The group felt that harbors that offered more services would be more likely to see higher levels of transient boats and would be both potentially more impacted by those boats as well as being more likely to be able to provide pumpout services. This criterion was evaluated using references to facilities provided by cruising guides that were updated by recent periodicals.

No services = 0 points
Limited services (Ex. moorings or restaurant only) = 1 point
Some services (Ex. Moorings/slips, gas, food, repairs) = 2 points
All services = 3 points

**E. Number of boats**

Obviously the number of boats that can visit a harbor at one time significantly affects the potential impact boaters could have on the water quality in the harbor, and it is difficult to know how many of those boats have installed heads. Because little data exists on the actual number of boats that frequent each harbor, the group had to make large groupings. This factor has the greatest variability and is subject to the most uncertainty of all of the criteria.

Few boats (less than 10) = 1 point
Some boats (10-30 boats) = 3 points
Many boats (over 30) = 5 points

**F. Flushing**

The amount of water that moves in an out of a harbor can drastically affect the potential impact of boaters on the water quality. Actual flushing calculations are very involved and require significant modeling. However, for the purpose of this ranking, the DEP engineers felt that 4 basic divisions would adequately segregate the basic flushing characteristics of the harbors.

Open ocean, large embayment or deep open mouthed harbors = 1 point
Large embayment, large mouthed-shallow harbors, or high flow estuaries (rivers) = 2 points
Small embayment, enclosed mouth moderate-deep = 3 points
Low flow estuaries, enclosed mouth shallow = 4

**G. Existing pumpouts**

Harbors with existing pumpouts, although no less sensitive, are already able to handle a certain amount of boat waste. The group determined that the impact of the number of boats (score under "E") can be directly modified by the presence of existing pumpouts. The group decided that the value for the existing pumpouts should be a multiplier for the number of boats.
1 existing pumpout = multiply (E) by .75
2 or more existing pumpouts = multiply (E) by .50

Priority Harbor Ranking Formula:

The advisory group came up with a ranking formula that was made to be simple but provide an adequate spread for prioritization. The ranking formula, {(A+B+C+D)(E*G)}F = score, results in a maximum score of 240 and a minimum score of 2. Based on the advisory groups review, it appears the formula captures the criteria in the right relationship to one another to reflect the overall priority for receiving pumpouts.

In detail, the formula adds the criteria scores from point sources, water quality, sensitive environments, and boat facilities. The number of boats score is multiplied by the pumpout score and multiplied by the sum of the first four criteria. So, in gross terms, the environmental sensitivity scores are multiplied by a boat number score that may have been modified by the number of exiting pumpouts. Finally, the product is multiplied by the flushing score. This means that the flushing ability of a harbor carries a lot of weight in the score.

No Discharge Zone Priority

Utilizing the criteria above, Maine DEP is proposing to use the formula of (B+C)*(E*F)/pumpouts.